

WELDING PROCEDURE SPECIFICATION

WPS - 2010/3003-1 **REV. NO.:** 0 **DATE:** 10/4/2004 **APPLICABILITY**

WELDING PROCESS/ES: GTAW and GMAW-SC ASME: X AWS: X

SUPPORTING PQR: P-WS-192-1 P-WS-190-1 OTHER:

JOINT This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.

Weld Joint Type: Butt/fillet Class: Full & partial penetration

See GWS 1-06 for joint details Preparation: Mechanical/thermal

Root Opening:1/16"-3/32"Backing:NoneBackgrind root:N/ABacking Mat.:None

Bkgrd Method: N/A GTAW Flux: N/A Backing Retainer: N/A

FILLER METALS: Class: ER-70S-x and ER-70S-x

A No: 1 **SFA Class:** 5.18 **and** 5.18 **F No:** 6 **and** 6 **Size:** .035 3/32 1/8

Insert: EBInsert Desc.: "A" ConsumableWeld Metal Thickness Range:Flux: Type:N/ASize: N/AAWS: 0.187 thru 1.000

Filler Metal Note: GMAW-SC wire dia. Limited to 0.035" ASME: 0.187 thru 1.750

BASE MATERIALS: P No. 1 Gr No. 1&2 to: P No. 1 Gr No. 1&2

Spec. Mild Steel Grade: All to: Spec. Mild Steel Grade: All

Qualified Pipe Dia Range: =: 1

Qualified Thickness Range: AWS: 0.187 thru 1.000 ASME: 0.187 thru 1.750

QUALIFIED POSITIONS: All All Vertical Progression: V-UP

Preheat Min. Temp.: 70 °F GAS: Shielding: Ar/GTAW or r/CO2 GMAV

Interpass Max. Temp.: 500 °F Gas Composition: 100 % 75 % 25 %

Preheat Maintinance: $70 \, ^{\circ}\text{F}$ Gas Flow Rate cfh: $10 \, \text{to} \, 25$

Backing Gas/Comp: Argon 100 **PWHT: Time @ °F Temp.** 1 **Backing Gas Flow cfh:** 3 **to** 8

Temp. Range: 1100 °F to N/A °F Trailing Gas/Comp: N/A %

PREPARED BY: KG Fellers DATE: 10/4/2004

Signature on file at FWO-DECS

APPROVED BY: Tobin Oruch DATE: 10/4/2004

Signature on file at FWO-DECS

Note:For SC/SS/ML-1/ML-2 work, this WPS requires independent review.

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WPS NO: 2010/3003-1

WELDING CHARACTERISTICS:

Current: DCEN and DCEP Tungsten type: EWTH-2 Transfer Mode: GMA-Globuler

Ranges: Amps 75 to 140 Pulsing Cycle: N/A to N/A

Volts 12 to 22 Background Current: N/A

Fuel Gas: N/A Flame: N/A Braze temp. °F N/A to N/A

WELDING TECHNIQUE: For cleaning, grinding, and inspection criteria refer to Volume 2, Welding

Fabrication Procedures

Technique: GMA Semi-auto **Cleaning Method:** Grind/wire brush/file

GMAW Gun Angle °: 5 to 15 Forehand or Backhand for GMAW (F/B): F only

GMAW/FCAW Tube to work distance: 3/8" to 1/2"

Maximum K/J Heat Input: N/A Travel speed: Gas Cup Size: 1/2"-5/8"

No single pass shall deposit greater than 1/2" thickness of material.

PROCEDURE QUALIFIED FOR:

Charpy "V" Notch: X Nil-Ductil Transition Temperature: N/A Dynamic Tear: N/A

Comments: (1) ASME GMA Weld metal thickness range=.0187" thru 1.75". (2) AWS GMA Weld metal thickness

range=.087" thru 1.0". (3) No single pass or bead shall be greater than 1/2" in thickness. (4) AWS

Pipe dia. thickness ==4.0"

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzel Angle	Other
1	GTAW	ER-70S-x	.035	75 to 125	12 to 16	0 to 0	5 - 15	
2	GMAW-SC	ER-70S-x	3/32	110 to 140	19 to 22	2 to 6		
3 4	GMAW-SC	ER-70S-x	1/8	0 to 0	0 to 0	2 to 6		
5								
6								
7								
8								

REM. * Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.